PROGRESS
OF
MEDICAL SCIENCE.

MEDICINE.

UNDER THE CHARGE OF
WILLIAM OSLER, M.D.,
REGIUS PROFESSOR OF MEDICINE, OXFORD UNIVERSITY, ENGLAND,
AND
W. S. THAYER, M.D.,
PROFESSOR OF CLINICAL MEDICINE, JOHNS HOPKINS UNIVERSITY, BALTIMORE, MARYLAND.

The Relation of Typhus Fever to Rocky Mountain Spotted Fever.—Ricketts and Wilder (*Arch. Int. Med.*, 1910, v, 361) have made a careful study of the clinical, anatomical, and immunological relationships between Rocky Mountain spotted fever and the typhus fever (tabardillo) of Mexico. In both the condition is that of a systematic blood infection and presumably lymph infection without the critical involvement of particular organs. Clinically the eruptions are very similar, differing but slightly in time of appearance and distribution. Gangrene occurs in both diseases. The spleen is habitually enlarged in spotted fever, not in typhus. The fever in typhus is more abrupt in onset and termination and the course shorter. They have the feature of insect transmission in common, the body louse in the case of typhus and ticks in spotted fever. It is probable that neither disease is contagious. A striking difference, however, is found in the susceptibility of animals to the two diseases. All attempts to infect laboratory animals with the blood of typhus fever patients have failed. Spotted fever can be transmitted to the guinea-pig invariably by the subcutaneous or intraperitoneal injection of virulent blood. This evidence shows definitely that the two diseases are not identical. In addition it was demonstrated that an attack of typhus fever in the monkey does not render him immune to spotted fever, although it does protect him against infection from a second injection of virulent typhus virus. The serum of typhus convalescents exerts no more protective effect against spotted fever than does normal serum. Such serums also show little or no more agglutinating effect for the bacilli which appear to be associated with spotted fever than do normal serums. The authors conclude from this evidence that the diseases are not identical and the organisms are not closely related biologically.

The Pressor Bases of the Urine.—BAIN (*Lancet*, 1910, i, 1190), working in Halliburton's laboratory, found the so-called pressor bases were most readily obtained by shaking the urine with blood charcoal (Fleming's) and extracting with ether and alcohol. The base in the ethereal extract is probably iso-amylamine, a derivative of leucine; that in the alcohol is p-hydroxyphenylethylamine from tyrosine. These extracts, from normal urines, will produce a rise in blood pressure when injected intravenously in cats. The exception is in normal urines from growing children in which they seem to be constantly in minimal amounts. The pathological interest lies in the fact that these pressor bases are very much diminished or entirely absent from the urines of individuals with high blood pressures. Bain feels that they are probably retained in the body and play an important part in the production of the increased blood pressure. Although he locates the source of these substances in the intestinal putrefactive processes, still he was unable to influence their presence by change of diet, lactobacilline milk, or, such intestinal antiseptics as calomel and salol.

The White Line of Adrenal Insufficiency.—In 1904 Sergent described a new sign of adrenal insufficiency due to arterial hypotension. It is the "white line" which results from the ordinary dermatographia test. LAUTIER and GREGOIRE (*Soc. de biol.*, 1910, lxvii, 690) found the white line present in 145 out of 228 cases; 65 of these had hypotension and 80 a normal or hypertension. The 83 cases which did not give the test included 30 with hypotension and 53 with normal or hypertension. The 80 cases with the white line without hypotension and 30 with hypotension without the white line make a total of 110, or one-half of the 228 cases tested which do not conform to the rule. They conclude that the white line cannot therefore constitute a sign of either adrenal insufficiency or hypotension.

Vasophylaxis.—ATKINSON and FITZPATRICK (*Proc. Soc. Exper. Biol. and Med.*, 1910, vii, 77) have found that dogs sensitized by a subcutaneous injection of 5 c.c. of tuberculin suffer a marked reduction in arterial blood pressure when serum from tuberculous rabbits is injected intravenously at an interval of twelve to eighteen hours after the sensitization. The reaction is specific as far as tested. Glanders serum, typhoid, antityphoid, antistreptococcus, normal rabbit, and normal horse sera have all been tested. The reaction is probably one of the many phases of sensitization or increased susceptibility, following the action of toxic substances. The reaction, it is suggested, if found sufficiently specific, may be used as another method for the diagnosis of tuberculosis. The authors tentatively name the phenomenon vasophylaxis.

Further Clinical Observations on the Sphenopalatine Ganglion.—A year ago SLUDER pointed out a symptom complex whose starting point was referred to the sphenopalatine ganglion. Its most frequent neuralgic manifestation is pain beginning at the root of the nose, taking in the upper jaw and sometimes the lower jaw, extending backward under the zygoma and frequently including the ear, marked at the mastoid but most intense at a point 5 cm. posterior to it. It reaches back over the occiput, descends into the neck, and even into the shoulder blade, shoulder, axilla, arm, forearm, and hand. The pterygomaxillary fossa in which the ganglion lies reacts like an accessory nasal sinus, and the neuralgia has arisen secondarily to inflammatory processes in the nasal sinuses. He has been able to stop the pain by applying cocaine to the nasal mucous membrane at the site of the sphenopalatine foramen, beneath which the ganglion lies. Sluder has further observed certain motor, sensory, and gustatory signs of this affection (*New York Med. Jour.*, 1910, xci, 850). A large proportion of the cases show an asymmetry of the arches of the soft palate with a slight deviation of the median ridge toward the well side. The arch on the affected side is the higher, and the uvula frequently inclines to the well side. The sensation is distinctly dulled on the affected side of the uvula as far forward as its junction with the hard palate. These signs he has observed to appear and disappear with the attacks of neuralgia. Fifty normal cases showed no asymmetry or difference in sensation on the two sides. In ten neuralgic cases tested, the sense of taste was more acute on the well side. It was constantly less acute on the side of the higher arch, or the side from which the median ridge was deflected. This remained slightly diminished after the attacks of pain had subsided.

The Elimination of Bacteria from the Blood through the Wall of the Intestine.—HESS pointed out a year ago that bacteria injected into the blood stream in rabbits could be recovered by culture from the contents of the small intestine. He has continued the work by investigating the path by which these bacteria enter the alimentary tract (*Proc. Soc. Exper. Biol. and Med.*, 1910, vii, 82). He employed Bacillus prodigiosus and rabbits in his experiments. Four routes seemed possible: (1) The bacteria may enter the lung and then gain access to the gastro-intestinal tract; (2) they may enter the intestine through the common bile duct or through the (3) pancreatic duct; or (4) they may traverse the wall of the intestine. Ligation of the pylorus, the common bile duct, and of the pancreatic duct had no influence upon the finding of these bacilli in two to three hours after injection into the ear vein. Division of the intestine into segments resulted in showing no difference at all in the permeability of the various segments of the intestinal wall. The bacteria were excreted by the bile and also were found in the urine, but they apparently traversed with ease the walls of the small intestine in a manner which, however, has not yet been demonstrated by Hess.

Experimental Hypophysectomy.—CROWE, CUSHING, and HOMANS (*Johns Hopkins Hosp. Bull.*, 1910, xxi, 127) have continued their reports of the study of the hypophysis and its removal. The total removal results in a state of apituitarism which leads inevitably to the death of the animal. This occurs with a peculiar and characteristic train of symptoms (cachexia hypophyseopriva). The animals become lethargic. The body temperature falls to approximately the room temperature. The gait becomes awkward and unsteady, especially in the hind legs. The blood pressure falls and the pulse becomes feeble, irregular, and slow. Tremors and spasmodic muscular twitchings develop; finally, complete anesthesia, then deep coma ensue, the transition to death being almost-imperceptible. That this is not due to surgical trauma is evidenced by the facts (1) that the same operative manipulations leaving the hypophysis in place and omitting the single step of removal leads to no symptoms whatsoever, and (2) that incomplete removals produce no immediate disturbances. These same symptoms follow the removal of the entire anterior lobe alone, even though the posterior lobe remains in place. On the other hand, removal of the posterior lobe leads to none of the manifestations of cachexia hypophyseopriva. Definite constitutional disturbances regarded by the authors as manifestations of hypopituitarism have been observed after partial removals (anterior lobe) in a number of animals kept under observation for long periods of time. The most striking feature is a state of adiposity accompanied by a secondary hypoplasia of the organs of generation in adults or by a persistence of sexual infantilism in case the primary hypophyseal deficiency antedates adolescence. Polyuria, glycosuria, alterations in skin and appendages (such as œdema and hypotrichosis), the tendency to a subnormal body temperature, and psychic disturbances are more or less frequent accompaniments—all of them symptoms which occasionally occur with states of adiposity and of sexual infantilism in man, in company with certain pituitary body tumors—states, therefore, which presumably are due to hypophyseal (anterior lobe) deficiency. Animals, in states of hypopituitarism, appear to have a lowered resistance to infection, exposure, or disease. Boiled anterior lobe emulsions appear to elicit a characteristic (anaphylactic?) febrile response when injected subcutaneously in states of experimental hypopituitarism.

The Function of the Hypophysis.—Franchini (*Berl. klin. Woch.*, 1910, xlvii, 613, 670, 719), as the result of extensive experimental investigations, has reached the following conclusions as to the functions of the hypophysis: (1) Administration of the hypophysis (obtained from the ox and the horse) leads to severe changes in metabolism, especially of the inorganic salts, manifested by a marked deficit in calcium, magnesium, and, to a less degree, phosphorus. (2) The hypophyseal extract produces glycosuria in rabbits only exceptionally. (3) Aside from its toxic action on rabbits and guinea-pigs, hypophyseal extract exerts a special influence on the intestinal canal, leading to ulceration and hemorrhage, probably due in part to vascular change, in part to lesion of the trophic nerves. (4) The extract is most toxic when administered intravenously, less so when given subcutaneously or by mouth; digestion of the extract in vitro lessens its toxicity somewhat. (5) The anterior lobe, freed from its epithelial covering, causes only mild symptoms in rabbits, but if the epithelial layer of the posterior lobe be included, death of the animal may ensue. The isolated posterior lobe exerts its effect particularly upon the metabolism and on the vessels and organs of the abdomen. (6) The posterior lobe contains a substance which produces active mydriasis of the frog's eye, but does not give the other adrenalin reactions. This body is absent from the anterior lobe, present in the epithelial layer, but to a less extent than in the posterior lobe. The serum of animals which have received extract of the posterior lobe causes mydriasis; this is seldom the case when anterior lobe extract is used.

The Detection of Levulose in the Urine.—JOLLES (*Münch. med. Woch.*, 1910, lvii, 353) proposes a slight modification of the Ihl-Pachmann reaction for levulose, by which it may be applied to the detection of levulose in the urine. By experiment the author has found that the Ihl-Pachmann test is capable of demonstrating levulose in a dilution of 0.005 per cent. If the urine to be tested contains no dextrose or dextrose up to 2.5 per cent., it is diluted ten times with water (for a 0.25 per cent. solution of dextrose may give a faint positive test for levulose, but only after boiling seventy to ninety seconds). To 1 c.c. of the diluted urine one adds 8 to 10 drops of a 20 per cent. alcoholic solution of diphenylamin and about 1 c.c. of concentrated HCl. The mixture is boiled about sixty seconds. If no levulose is present, the solution remains colorless; if even 0.05 per cent. of levulose is present (in the undiluted urine), a characteristic blue color appears after boiling about forty seconds. Where dextrose amounts to between 2.5 per cent. and 5 per cent. in the urine, the latter must be diluted twenty times before applying the test, which is now capable of revealing the presence of 0.1 per cent. of levulose or more.

The Meiostagmin Reaction in Typhoid Fever, Tuberculosis, Echinococcus Disease, and Ankylostomiasis.—IZAR (*Münch. med. Woch.*, 1910, lvii, 842) reports further observations on the diagnostic value of the meiostagmin reaction, which tend to show that it is specific and of value in clinical medicine. In 40 cases of pulmonary tuberculosis, in which the diagnosis was confirmed by the cutaneous test or the finding of bacilli, or, in most cases, by both, 39 gave a positive meiostagmin reaction. Sera from 74 non-tuberculous patients tested with tuberculous antigen reacted negatively. The tuberculous sera were negative when tested with the antigens of typhoid, lues, tumor (malignant?), ankylostoma and echinococcus. In like manner, the meiostagmin reaction was positive in 9 cases of typhoid fever. Sera from 6 patients suffering with ankylostomiasis gave positive reactions only with ankylostoma antigen. A negative reaction obtained with the serum of a patient infected with Strongyloides stercoralis when tested against ankylostomum antigen, was striking. Seven cows and three swine having echinococcus cysts showed a positive reaction with echinococcus antigen. These results agree with those recently reported, and make it highly probable that the meiostagmin reaction will prove to be of great aid in diagnosis.

The Relation of Diacetic Acid to B-Oxybutyric Acid.—BLUM (*Münch. med. Woch.*, 1910, lvii, 683) reports observations made on man and dogs which are of great interest in connection with acidosis and the metabolism of the fatty acids. In normal dogs he has introduced various substances subcutaneously in large quantities, and in normal men and mild diabetics has given them per os. His studies have resulted in the following conclusions: (1) β-oxybutyric acid may be derived from diacetic acid both in dogs and man. (2) In the metabolism of the fatty acids, such as butyric, caproic, and isovalerianic, diacetic acid arises. (3) β-oxybutyric acid is not converted into diacetic acid in the normal animal. (4) The change of β-oxybutyric acid into diacetic acid is probably the result of disease of the liver cells; the glycogen content of the liver does not explain the change. (5) Crotonic acid, an unsaturated fatty acid, is converted into β-oxybutyric acid by the addition of water. (6) The surviving liver of normal dogs may reduce diacetic acid to β-oxybutyric acid. (7) β-oxybutyric acid is much less toxic than many other fatty acids. This fact makes it difficult to accept the theory (von Noorden, Lepine) that β-oxybutyric acid is the specific poison causing coma diabeticum.

The Etiology of Hodgkin's Disease and Lymphatic Leukemia.—Fränkel and Much (*Münch. med. Woch.*, 1910, lvii, 685) have applied the antiformin method to the study of organs, especially glands and spleen, of patients having Hodgkin's disease and lymphatic leukemia. In nine out of ten cases of Hodgkin's disease they have found a granular bacillus which stains by Gram's method, but not by Ziehl's, resembling the tubercle bacillus morphologically and, like it, antiformin-fast. This bacillus was associated with the tubercle bacillus only exceptionally, but it appears to be closely related to the latter. As cultural experiments were negative, a more intimate study of the organism was impossible. Likewise, in seven cases of lymphatic leukemia, the antiformin method revealed a rather thick, granular rod, Gram-positive but Ziehl negative, present in the lymph glands and spleen. They believe these organisms, apparently closely related, will prove to be of etiological significance. Similar studies of tissues of myelogenous leukemia, mediastinal tumor, and carcinomatous glands have shown no organisms.

A Comparative Study of Wassermann Reaction, Lymphocytosis, and Globulin Test in Diseases of the Nervous System.—Wolff (*Deut. med. Woch.*, 1910, xxxvi, 748) has made a study of the comparative frequency of the Wassermann reaction in the blood and cerebrospinal fluid, and of lymphocytosis and the globulin test in the cerebrospinal fluid, in 100 cases of disease of the nervous system, including 40 cases of tabes dorsalis, 30 of dementia paralytica, 9 of cerebrospinal lues, 5 of apoplexy, 4 of alcoholic neuritis, 6 of neurasthenia, and 6 of epilepsy. He finds that of the three reactions the globulin test gives the most constant results; it is valuable in that it is negative in those cases of syphilis in which no para- or metasyphilitic affections are present. Lymphacytosis and globulin reactions are valuable also in differentiating between organic disease of the central nervous system and peripheral or functional nervous disorders. Complement fixation in the cerebrospinal fluid was much less constant in its occurrence than were lymphocytosis and the globulin reaction.

Rheumatic Parotitis.—Courtois-Suffit and Beaufume (*Bull. et mém. de la Soc. méd. des hôp. de Paris*, 1910, xxvii, 3 s., 194) call attention to a complication of acute rheumatic fever which has never been described before—inflammation of the parotid gland. From the three cases reported by them, the inflammation is usually unilateral, and may appear either when the joint symptoms are at their maximum or at any time up to the beginning of convalescence. The process is of short duration and may clear up completely in from thirty-six hours to five days. The temperature may rise to 40° C. In two instances the arthritis and parotitis were present simultaneously, while in the third case the arthritis ceased when the parotitis began and developed again on the disappearance of the parotitis. The authors believe that the cause of the parotitis is the same as the etiological factor of the arthritis, and they therefore, used sodium salicylate as treatment.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

JOHN RHEA BARTON PROFESSOR OF SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE UNIVERSITY HOSPITAL,

AND

T. TURNER THOMAS, M.D.,

ASSOCIATE IN SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; SURGEON TO THE PHILADELPHIA GENERAL HOSPITAL, AND ASSISTANT SURGEON TO THE UNIVERSITY HOSPITAL.

Bony Union of the Radial Diaphysis Obtained with the Use of an Immovable Metallic Ring.—MAUCLAIRE (*Archiv. gén. de Chir.*, 1910, vi, 140) calls attention to the difficulties often experienced in obtaining satisfactory union after a fracture of the radial diaphysis, whether the radius alone or the radius and ulna are fractured. Sometimes the four fragments are fused solidly together, more frequently the upper fragment of the radius is drawn to the ulna by the pronator teres and the lower by the pronator quadratus. He refers to a case in which from such a cause the patient was incapacitated 75 per cent. Wire suture of the bones leads frequently to a rarefaction of bone and interferes with union, even when the periosteum is carefully saved. He obtained good results from the use of an immovable metallic ring. This consists first, of an ensheathing plate, 4 cm. long, and underneath the upper part is a smaller plate furnished with four points which can be pressed by means of a screwdriver down on the fragments, which are thus approximated. By means of a second instrument the ring can be withdrawn. The wound is left open and packed with gauze, and the forearm is encased in a plaster bandage. In some cases non-operating treatment does very well, especially if there is little tendency to deviation of the fragments. When there is a persistent deviation of the fragments, operation becomes necessary. The metallic ring produces little traumatism of the bone, since it is not penetrated. The fragments are coapted by simple pressure.

Extension Treatment in Fractures of the Leg.—KNOKE (*Zntrlbl. f. Chir.*, 1910, xxxvii, 497) says that after trying for a long time the Bardenheuer method of extension without satisfactory results, and later Rucker's modification, he has come to the employment of a method of his own, and finds it much more satisfactory. After careful padding of the foot, especially the dorsum to above the malleoli, a